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A COMPLETE LIST OF
The Photo-Miniature Series

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*3. Hand-Camera Work
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105. Correct Exposure
106. Oil and Bromoil Printing

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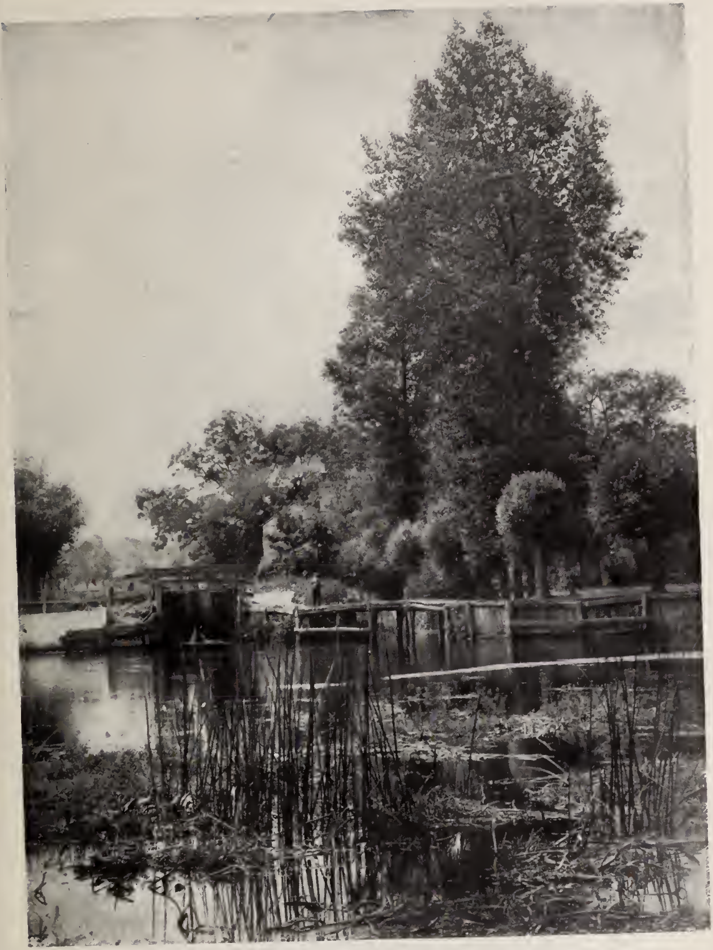
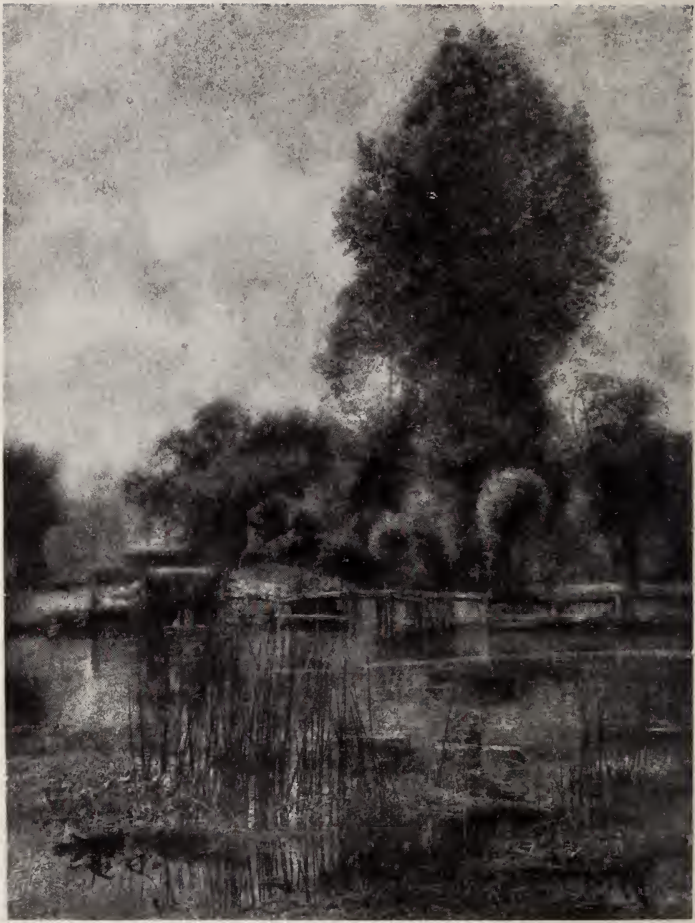


The Mill Dam. S. L. Coulthurst, F.R.P.S.
Direct print from the negative
(Compare with frontispiece on next page)



The Mill Dam: By S. L. Coulthurst, F.R.P.S.
Oil print, pigmented for broad effect
(Compare with direct print on preceding page)

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The Photo-Miniature
A Magazine of Photographic Information
EDITED BY JOHN A. TENNANT
Volume IX MARCH, 1910 Number 106

Oil and Bromoil Printing

In past issues of THE PHOTO-MINIATURE we have taken as our subject every one of the processes of photographic printing which offer the means of making visible everything in the negative. Everything—did we say? We recall the expression when we remember such methods as gum-bichromate, the avowed purpose of which is to permit the photographer to transfer as little of the negative to the print as he thinks fit. Other processes, or rather special methods of working them, allow of the same thing being done to a lesser degree, but none has approached the so-called "oil" and Bromoil methods in this facility or latitude of "control:" which word in this present connection may have quite a misleading signification, inasmuch as the one thing which is often evident in examples of the process is the inability of the worker to exercise a proper and pleasing control over the variations which he is pleased to play on the original air of his negative.

To this we will return later. Meanwhile, we must explain that in oil and Bromoil printing the basis upon which we build up the photographic image is a surface which to all intents and purposes is blank. An image there is, but so faint that in comparison with what is applied to the paper it is of no account. The full depth of picture is produced by the application of a pigment with a brush. In doing this, the worker can, if he likes, approximate fairly closely to the tones which the negative would give if printed in carbon or platinotype.

Equally, he can depart from this "straight" course to a very great extent—more than in any other process. At the same time he can see instantly what he is doing and, if he does not like it, can clear off all trace of the pigment he has applied and start afresh. With such features as these in its favor, no wonder that oil and Bromoil have fascinated European workers with artistic aims. The French pictorialists, headed by MM. Demachy and Puyo, were the first to show its possibilities, and speedily discarded gum-bichromate to work in "oil." British workers, with scarcely less enthusiasm, adopted "oil," evolved Bromoil—which is to "oil" what bromide or gaslight is to print-out paper—and have bracketed the two first among the processes which, with a touch of affectation, are termed the "media of personal expression." It will be clear, then, that if these processes open the path to splendid successes, they likewise hasten the journey to an Avernus of artistic offences. The fact remains that, with all their faults,—and the chief of these is that the essential part of the business is not photography at all,—they have awakened an immense amount of interest in Europe. Therefore, now that the working methods are well established and the materials for their practice obtainable here, it is fitting that the precise instructions should be brought together, and the American worker put in the position to "try out" in "oil" for himself.

The Principles

The basis of the processes is very simple. It is that of the collotype process, so largely used for the better grades of postal cards. In the collotype process, a plate, usually of glass, is coated with a mixture of gelatine, which is rendered sensitive to light by soaking in a solution of potassium bichromate. As workers of the carbon process well know, such a surface, on exposure to light, becomes insoluble in hot water. But that is not the only change. There is another which is of even greater technical importance. In proportion to the action of the light upon it, a film of bichromated gelatine acquires the power of retaining any greasy ink which is applied to it in a suitable way. A wet film of unexposed gelatine, whether containing bichromate or not, repels, instead of attract-ing, greasy ink ; but, after exposure to light, it passes into a peculiar hardened condition wherein it holds a film of ink which is presented to it, say, on a roller. This is the basis of the collotype process, the sensitized glass plate being exposed under a negative, soaked in water and, while still wet, " inked up " with a roller lightly charged with a greasy ink. The inked positive impression on the glass is the so-called " collotype plate," from which large numbers of prints may be obtained by bringing paper in contact with the surface, in presses constructed for the purpose. Collotype dates back to the year 1855, when it was invented by Poitevin in France. Except for the suggestion of an English worker named Asser, in 1860, the idea of obtaining the positive image of hardened gelatine on paper, and from this producing *one* pigment print by means of a brush, never seems to have occurred to anybody until Mr. G. E. H. Rawlins, in the "Amateur Photographer" (1904), drew attention to the ready means thus provided for building up the picture with any modifications in tone which seemed desirable. At the same time he offered working instructions for carrying out the process in this modified form.

In the case of Bromoil, the intermediate result is similar, i. e., an invisible or nearly invisible image composed of hardened gelatine; but the steps by which it is secured are different. The starting point is a bromide print, which by chemical treatment is bleached away, leaving in its place the semi-visible image to which the ink is applied. There is no exposure to light, subsequent to making the bromide print from the negative in the first instance. The developed silver image of the print serves the same purpose as the exposure to light in the case of the "oil" method, although it must be admitted that at present no satisfactory explanation of the actual nature of this process has been forthcoming.

Features of Each Process

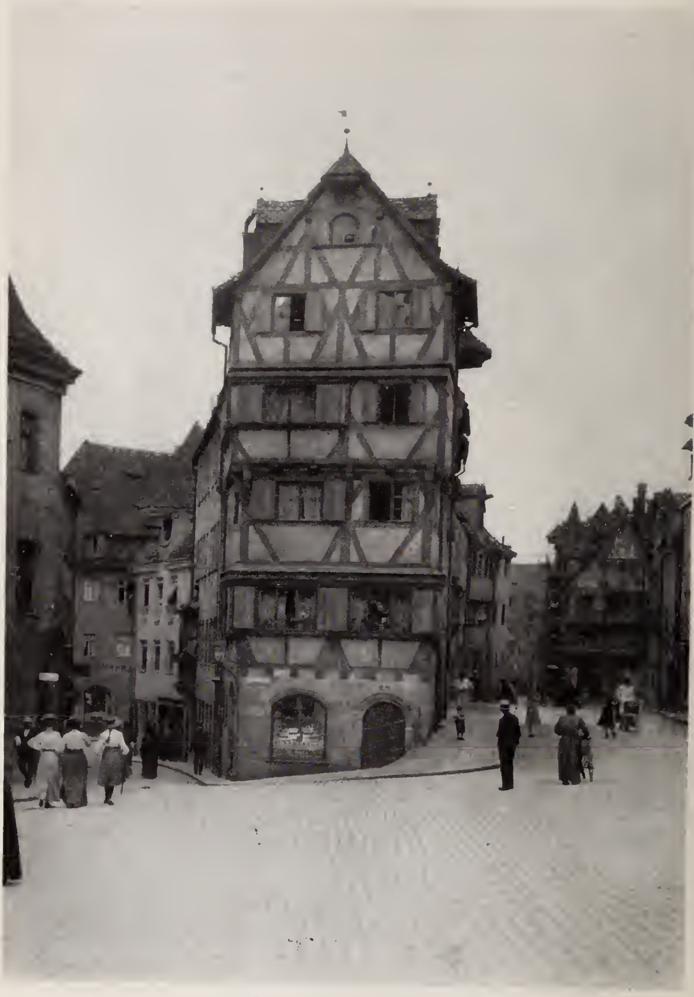
Before passing at once to the working methods of " oil " and Bromoil, a word may be said as to the relative advantages which each offers to the worker. " Oil " is a contact printing method. The sensitive paper requires to be exposed to the negative by daylight : the sensitiveness of the bichromated paper is on a par with that of carbon tissue, so that the printing from the negative has to be done by daylight. In other words, so far as concerns exposure, "oil" is more akin to carbon than to any other process. This means that unless the original negative is of fair size, at least 5 x 7, or better, 8 x 10, an enlarged negative requires to be made. Oil prints smaller than 5 x 7 are not really practicable, since the fineness of the details of the subject on this small scale makes it difficult to carry out the local application of the ink. Bromoil, on the other hand, simply means making first of all a bromide print or enlargement from the negative. When such a good print has been made, the rest depends only on properly carrying out the bleaching operation and the subsequent treatment. So far as results, the general opinion is that the "oil" method gives somewhat finer effects; that is to say, the final result has more of the characteristic quality of this class of print than that made by Bromoil. Moreover, with "oil," it is possible to do more in the pigmenting process, whilst retaining this quality, than is the case with Bromoil. Lastly, "oil" is certainly less liable to unexplained causes of failure, such as difficulty in getting the ink to take, than Bromoil. Not that Bromoil must be represented as an erratic method, but there is the fact that carelessness in the bleaching and subsequent treatment is more likely to cause trouble than will the same neglect of proper precaution in the case of "oil." This, however, need not for a moment deter the worker from availing himself of the facilities of working in the evenings which the Bromoil method provides.

The Oil Process

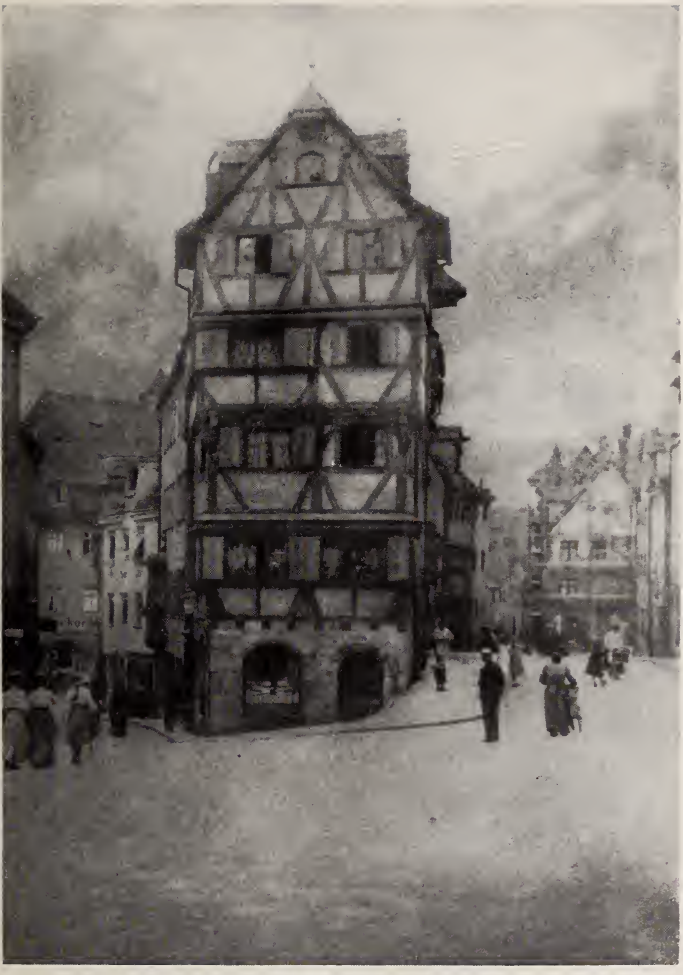
Now let us take a brief preliminary run through the procedure of the "oil" method before making ourselves acquainted with actual working details. Assuming we have at disposal a suitable enlarged or direct negative, step No. 1 is to sensitize the sheet of gelatine-coated paper which will form the final print. This is done the evening before the day of printing if the ordinary carbon sensitizer is used, or immediately before use if the more convenient and efficient form of quick-drying autotype spirit sensitizer is adopted. Step No. 2 consists in printing under the negative. Step No. 3 is simply the removal of the bichromate sensitizer by washing the print in water for about twenty minutes, followed by about an hour's soaking in water, in order to let the gelatine swell to the full. If preferred, the washed print can be put aside to dry, and the latter part of the process taken up at any convenient time later. Step No. 4, and last, is the "development" or pigmenting of the print (as it lies on a moist pad) with ink applied with a brush, or rather with a series of brushes. This is the part of the process calling for the greatest practice—and, of course, also for the sense of what is an improvement of the picture. It is also the part of the process of which least can be taught in the handbook.

The Negative

The type of negative necessary to secure the richness which is the mark of a good "oil" print is one with clean shadows free from fog and without undue density in the high-lights,—in other words a negative which is first-rate for carbon or platinotype. Naturally, a process like "oil" will give results from negatives which would be useless for any other process; but still the process, if it is to be seen at its best, does require a really good negative. The making of an enlarged negative is beyond the scope of the present monograph, and is moreover fully dealt with in No. 100 of THE PHOTO-MINIATURE. One point only may be mentioned, as it is the most common mistake among those that are beginners in such work. In preparing the positive transparency by contact from the original negative, use a fairly rapid negative plate, not a plate of the lantern or photo-mechanical type which gives great brilliancy. This latter quality is just the one which must be avoided in a diapositive or transparency which is to be enlarged. The transparency should have no clear glass anywhere. There should be full detail all over, but the high-lights have quite a decided veil over them. Enlarged onto a lantern, or photo-mechanical plate, or negative paper, such a diapositive as this will give an excellent result without the great increase in contrast—even to the point of hardness—which is the common defect in enlarged negatives.



In Old Nuremberg
Direct bromide print from negative



In Old Nuremberg: F. C. Tilney
Bromoil print showing the subordinate values given to the more distant parts of the subject

Papers for Sensitizing

The paper for the "oil" process is simply one of a fairly smooth surface, coated with fairly hard gelatine. Papers for the purpose are now specially manufactured, those already on the American market being the Autotype Company's (Burke & James, Chicago; Hirsch & Kaiser, San Francisco; George Murphy, Inc., New York). In Britain, of course, from the Autotype Company, London. Nos. 1 and 2 of these papers are the white and toned respectively, the latter a somewhat deep cream tint, which is especially suitable if pigmenting is to be done with brown or sepia ink. Both these papers have little surface to them, they are not rough nor yet dead smooth. The No. 3 paper (white) is rather smoother, resembling a "cream wove" writing paper. These papers are put out in sheets from 4¼ x 5¼ to 12½ x 15½ inches, beyond which size the worker in oil is not likely to be enticed, on account of the time occupied in the pigmenting process and, in what sometimes takes almost as long, cleaning up the print afterward, removing tiny particles of hair, etc. Some workers are quite content with papers having a lighter coating of gelatine than those specially prepared, and have used the double transfer papers supplied by makers of carbon tissue. Thus, the Autotype double transfer papers, Nos. 76 and 77, are very suitable for oil printing.

The Ozobrome Company, London, also make four papers specially for the oil-process: OF, (cream crayon), OB (white medium grain), OO (toned etching), and OC (white etching).

Griffin & Sons, London, who were in the field with materials for the oil process as early as 1906, supply gelatine-coated paper prepared according to the formula of Mr. Rawlins, and sold under the uneuphonious name of "Pigmoil." It is issued in two varieties, rough and smooth, both white and both giving a surface which takes the pigment most readily in the shadows, and equally repels it vigorously in the high-lights. The makers' claim for the paper, that it gives a very high degree of brilliance, is certainly borne out by its behaviour. Messrs. Griffin have already placed supplies of the paper with dealers in the United States, among whom may be named Ralph Harris & Co., Boston, and J. L. Lewis, New York.

Other makes of double-transfer paper which have found special favor are those of Thomas Illingworth, which M. Demachy recommends, and of Elliott & Sons, Barnet, England; (G. Gennert, New York,) and the Rotograph Company, London.

In cutting paper to size for printing, it is well to leave a margin all around of at least half an inch in width. If the picture be printed close up to the edges of the paper, the brush used in pigmenting cannot be easily kept off the almost wet support on which the print is laid at this stage of the process, and the result is that the hairs of the brush lose their shape sooner than they would otherwise.

Gelatine Coating of Paper

With so many varieties of paper available for the process, the worker is not likely to find it necessary to prepare his own; still, for the sake of those adventurous and discontented souls who must forever be trying something beyond the limits which Providence and the manufacturers have set, we will name one or two methods by which an even coating of gelatine may be applied to any suitable paper.

The method of applying the gelatine requires to be selected with reference to the character of the paper: a smooth paper can be floated on the gelatine solution, or the latter may be flowed over the paper, in which case the paper must be placed on a leveled glass plate. In the case of rough papers, these methods do not give a sufficient intimacy of application right into the depressions on the surface. For such papers, the gelatine solution needs to be applied with a brush. The novice in this work cannot expect to obtain the quite even coating of the machine-prepared paper, particularly in the case of large sheets; but, as these are not likely to be required in the oil process, there is no reason why the gelatine coating should not be done by the worker who is unable to get exactly the material to his liking. First, the coating and soaking methods for smooth papers, as distinguished from the brushing for the rougher. The gelatine solution of strength given below is filtered through muslin immediately before use, is placed at hand, and kept at a suitable temperature by standing the containing vessel in warm water. A glass plate, a little larger than the sheet, is adjusted level, and then raised in temperature by dipping in warm water, the paper to be coated being also immersed. The two are brought together under water, the paper lightly squeegeed, and the glass replaced on the leveling wedges or screws. The gelatine solution is then poured on the paper and allowed to flow over, the paper being removed from the glass when the gelatine has set. A suitable strength of solution is 30 grains per ounce of water, two ounces of which is an average quantity for a sheet 12 x 15 inches. Instead of flowing on, a useful artifice to secure the gelatine-coating on one side of the paper only is to place two pieces back to back, and to draw the pair steadily through the gelatine solution. Each pair of sheets, still unseparated, is hung up to dry, and the edges then trimmed away, when it will be found that when the papers are carefully manipulated the solution creeps in between the two not more than half an inch.

For rough papers, the solution must be brushed over the surface. A suitable solution for this purpose is that commonly used in making double transfer papers. If one application does not give a thick enough coating, the best plan is to repeat the process, after the paper has dried, rather than use a stronger solution. Nelson's No. 1 gelatine, 1 ounce; water, 20 ounces; chrome alum, dissolved in 1 ½ ounces hot water, 12 to 15 grains; alcohol, 1 ½ ounces.

In making up this mixture, the gelatine is first put into the cold water until completely swollen, and then rendered fluid by placing the vessel in hot water, in the usual way. It is then brought to a temperature of about 130° Fahr., and the chrome-alum solution at about the same temperature added in small doses, with constant stirring. The spirit, also in small lots, is last added. This solution is kept at about 130° Fahr., and applied to the paper with a large, flat, soft hog-hair varnish brush, one of three or four inches' breadth. This operation must not be done in a cold room, or the gelatine will set so quickly as to make it impossible to give a coating free from streaks. Temperature should be at least 75° Fahr.

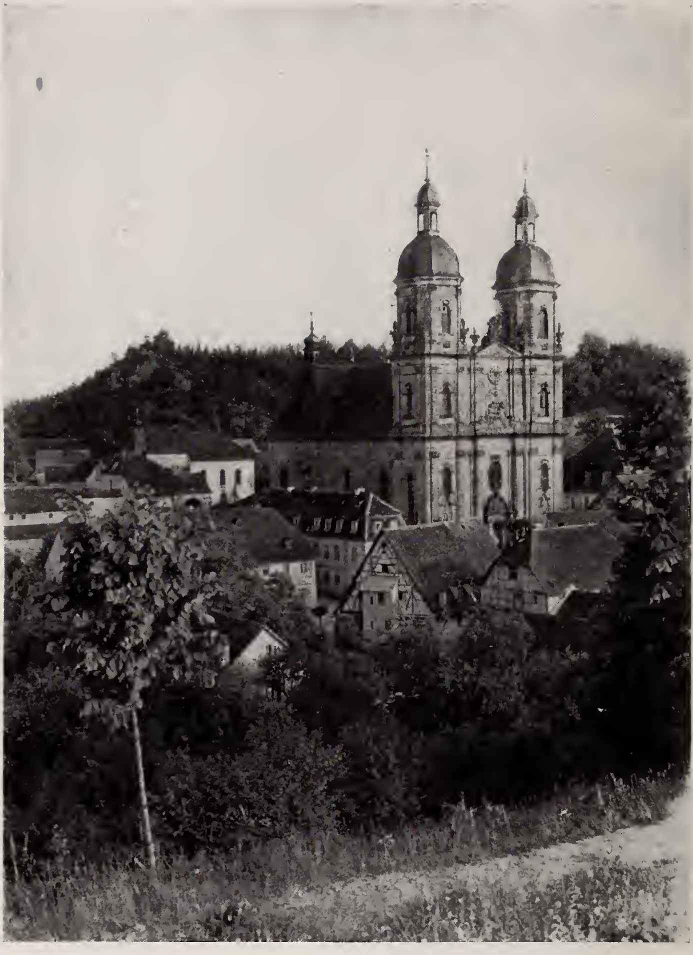
These formulæ and directions will, as we have said, enable the worker to prepare his own papers; though he will be well advised to employ, at any rate to commence with, a commercial double-transfer paper of good quality readily obtainable at any supply store.

Sensitizing the Paper

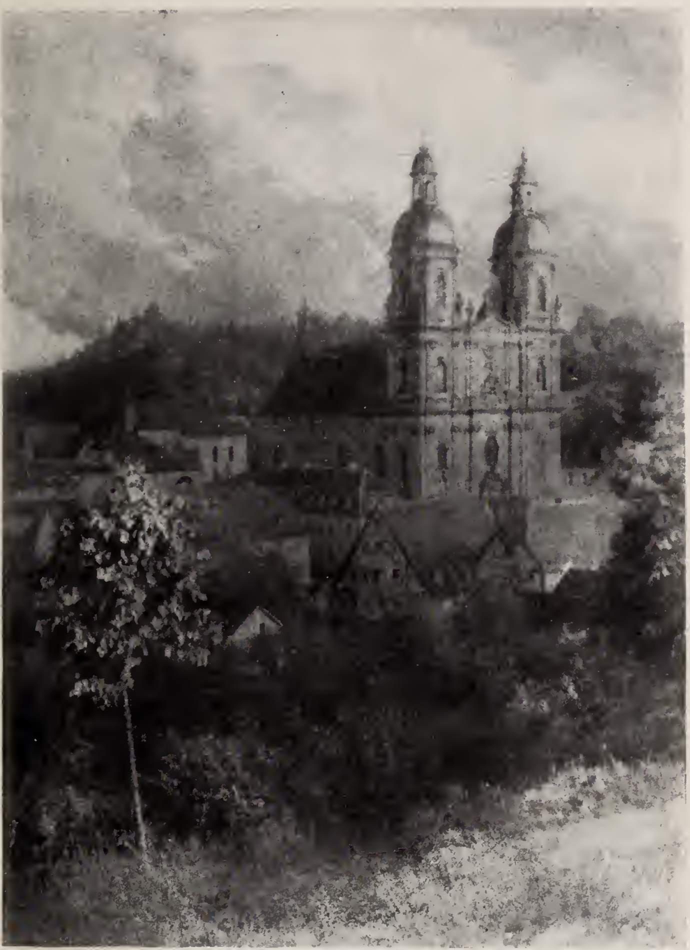
The gelatine-coated paper, as purchased, will keep in good condition indefinitely. Sensitized, it may be kept, say, for three or four days, but the best results are secured by printing within an hour or so of the paper's drying. The sensitizer may be the solution of potassium, or other bichromate customary in carbon printing, and used by immersing the paper in it; but the drawback to this method, from the amateur worker's standpoint, is that sensitizing must be done the night preceding printing, in order to allow the paper to dry. This means that if, as is often the case, the weather then proves unsuitable for printing, or if something else intervenes to postpone the work, the paper is most probably spoilt. A method of sensitizing which can be completed within a few minutes is a much more convenient one when working on this small scale, whilst the results which it gives are, if anything, superior to those by the slower process. The beginner is therefore strongly advised to adopt the use of a spirit or quick-drying sensitizer applied by hand to the paper, in preference to the use of plain water solution of bichromate in which paper is immersed. We will therefore take the spirit sensitizer first.

Rapid Sensitizing

In preparing a spirit sensitizer, ammonium and not potassium bichromate must be used, on account of its greater solubility in the spirituous mixture. One excellent formula is that of M. Demachy's: A 6 per cent solution of ammonium bichromate is made by dissolving 1½ ounces of the salt in 25 ounces of water. The sensitizing mixture is made by well stirring 1 part of this bichromate solution with 2 parts of 90 deg. alcohol. About three quarters of an ounce of this mixture will



A Bavarian Village
Direct print from negative



A Bavarian Village: F. C. Tilney
Bromoil print, showing light accents put in on bush at the left, the distance and middle distance thrown back and sky added

suffice for six 8 x 10 pieces of double transfer paper. The paper is pinned to a drawing-board, and the sensitizer applied with a flat hog-hair brush. M. Demachy thus describes his exact working method: "Dip the extremity of your brush in the alcoholic mixture, draw it horizontally along the upper part of the sheet, and, with rapid downward strokes, gather the solution from the top streak and cover the whole sheet. But only the tip of the brush must be immersed in the bichromate solution. The gelatine coating of the double transfer papers is so thin that it will absorb only a very small bulk of liquid. If the quantity applied is superior to the power of absorption, the solution will settle in small pools and will cause streaks under the action of the brush. In such a case, the streaks can be removed by passing a dry and perfectly clean camel's-hair brush, or badger softener, over the still wet surface of the sheet." The paper will usually take less than fifteen minutes to dry, and both drying and sensitizing may be done by weak daylight; but when the paper is dry it becomes much more sensitive, and therefore this part of the process is best to be done in a dark room, or one lighted only by yellow light.

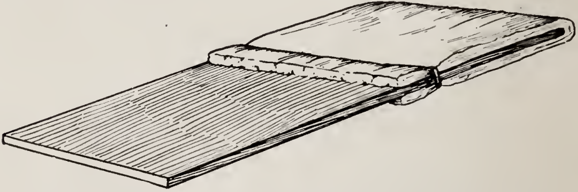


FIG. 1. Blanchard brush, a strip of flannel bound to glass. Used in applying the spirit sensitizer

Autotype Spirit Sensitizer

The Autotype Company's preparation, supplied for the rapid sensitizing of carbon tissue, is excellent for "oil" paper. Mr. S. L. Coulthurst has specially recommended it to the beginner in the process, on the ground that this factor in the process is thus kept standard. For applying it, the makers supply with each bottle one of the old-fashioned Blanchard brushes (fig. 1), which is a slip of glass about 6 x 2½ inches, to one end of which a piece of flannel is strapped by an elastic band. The paper to be sensitized is pinned to a drawing-board by means of thumb-tacks, interposing one thickness of dry blotting-paper. The "brush" is dipped in the sensitizer and drawn in parallel strokes over the paper, a very even coating being thus applied. In a warm place, the paper will become dry in about ten minutes. The whole operation requires scarcely a quarter of an hour even in unexperienced hands.

Other Sensitizers

Those who have experience in sensitizing carbon tissue in the ordinary bichromate baths, as described in THE PHOTO-MINIATURE No. 86, will perhaps prefer to use the older method of *immersing* the paper in a solution of bichromate in water. Some "oil" workers prefer to use a somewhat weak sensitizer, namely 2 to 3 per cent, instead of the 4 per cent, which is the average for the carbon process. Mr. Rawlins, on the other hand, advises a 5 per cent solution of potassium bichromate. Mr. James A. Sinclair, one of the pictorial workers of ten years ago who has been attracted back to the ranks of exhibitors by oil, prefers the carbon sensitizer given by Mr. H. W. Bennett, and made as follows: Potass bichromate, 240 grains; citric acid, 60 grains; water, 25 ounces; ammonia .880, enough to turn the orange tint of the solution to lemon-yellow (usually about 3 drams). For the Pigmoil paper a similar sensitizer is prescribed as follows: Potassium bichromate, 200 grains; potass citrate, 2½ ozs.; citric acid, 100 grains; water, 25 ozs.

In sensitizing papers with any of these solutions, a useful little dodge is that of Mr. Rawlins: Select a quite flat-bottomed dish, a couple of sizes larger than the paper, pour in the sensitizer, immerse the paper for about two minutes, and then pour off the liquid, leaving the dish in a sloping position. The paper is then drawn slowly off by an upper corner, and this action, if repeated twice for the face and once for the back of the sheet, removes all excess of sensitizer and avoids the formation of drops on the surface. Paper sensitized in baths containing no spirit must be put to dry where there is free access of air, so that drying takes place in not more than five or six hours; otherwise partial insolubility of the gelatine supervenes, and the paper will of course not work properly. In short, one works with just the precautions necessary when sensitizing carbon tissue in ordinary practice.

Printing

Unlike carbon, the sensitive oil paper gives a visible or semi-visible image, there being, of course, no pigment in the gelatine to mask the action which the light produces. The effect of sufficient exposure under a negative is to give a brown image something like that of a platinotype print at the same stage. Exposure can be controlled just as in the latter process, and, with a little practice, this is the best method. When sufficiently printed, the paper should show a fairly distinct brown image on the yellow ground, with detail visible in the high-lights. In good summer light (shade, not sun), this will mean an exposure of about five minutes from a clean quick-printing negative. The paper, remember, is more sensitive to daylight than gelatine print-out paper, and therefore requires to be more carefully handled; frames should be filled and the print examined only by the weak daylight of a room, or by gaslight. Remember, too, that certainty in exposure is largely conditioned by having the paper bone-dry when placed in the frame, and, in damp weather, by taking the same precautions in the shape of rubber pressure pads as in platinotype printing.

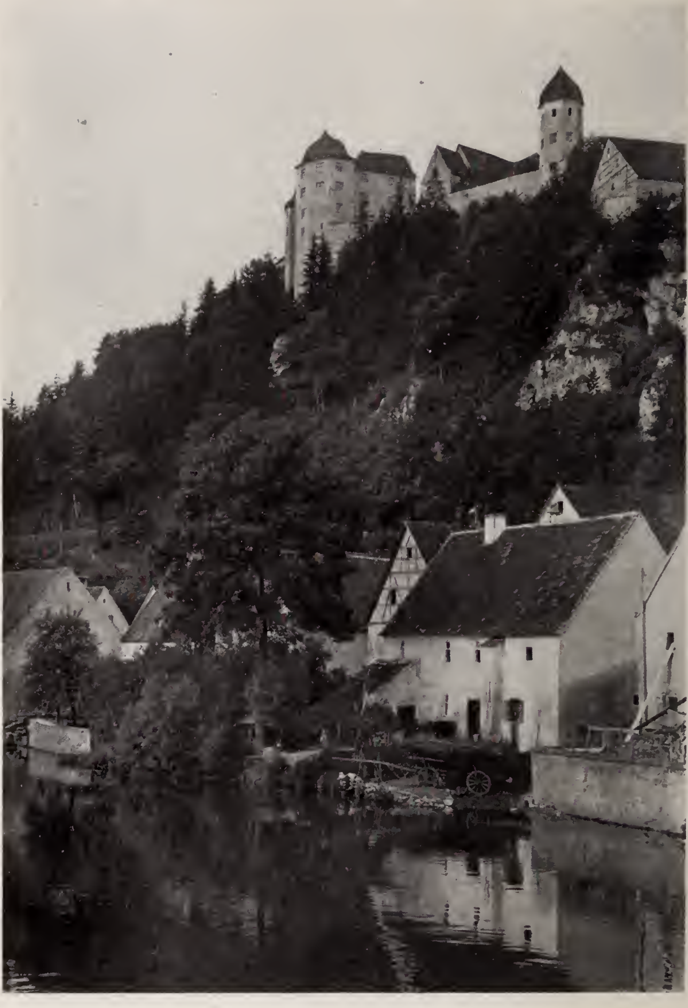
Some workers, M. Demachy among them, prefer to expose by actinometer, and it is a reliable method. Still, the beginner who has no experience of it need not thereby be deterred from taking up "oil."

Preparing for Pigmenting

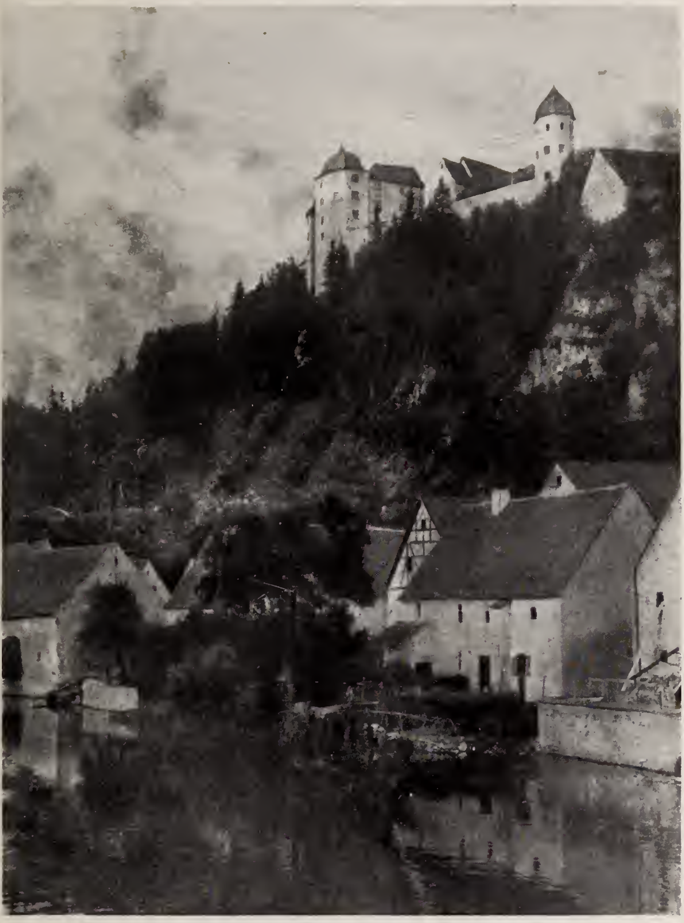
The exposed print should be washed in water immediately after exposure. The object of the washing is two-fold,—to remove the unaltered yellow bichromate and to bring the exposed surface into the necessary swollen condition for pigmenting. Washing in running water will remove the bichromate in twenty minutes, or still more rapidly if a little potass metabisulphite or bisulphite liquor (a few grains or minims to 20 ounces of water) be added, to form a bath which is applied after one or two soaks (or a minute or two's washing) have been given in plain water. The subsequent soaking process is much longer, the time depending on the character and thickness of the gelatine coating. In the case of a thinly coated paper, such as an ordinary double-transfer, half an hour will probably be enough; for papers more thickly coated, two or three hours or even longer. The result of this soaking is to cause the image to appear (when surface water is blotted off with clean soft cambric) in slight but well marked relief, and unless this is the case it is useless to expect it to take the pigment as it should. The chief cause of failure here is letting the water in which the print soaks be too cold. If it falls appreciably below 65° Fahr., it loses its effect to a great extent. The temperature should be slightly over 65° Fahr., from that to 70° Fahr., but not warmer. It is useless to try to dodge this degree of heat by adding warm water every now and then to a cold bath. The dish should be put into a room at a steady temperature, and the print left to itself in the water, beyond an occasional rocking of the dish. If, after this soak, it is thought well to defer pigmenting, the print can be dried and put away. It is prepared again for pigmenting by giving an hour's soaking in water, or longer, again at a temperature between 65° and 70° Fahr. In fact, this drying hardens the film as a whole, and while it appears to be without disadvantage it enables the print to withstand pigmenting better.

Inks

A great deal depends upon the use of a suitable ink. Mr. Rawlins, soon after his introduction of the process, placed a special ink on the market in England, through Messrs. Griffin, and has lately much improved his product. Inks for the oil process (they apply equally to Bromoil) are also made by the firm of Jas. A. Sinclair & Co., London. But the worker in America who cannot obtain these supplies need therefore not lose a day in getting to work. Let him obtain from a dealer in printers' supplies some samples of ink, as used for the best class of half-tone printing or collotype work. Let him ask for a good "hard" ink of one or other of these kinds. These inks are not of the hardest or stiffest class, and a



A Bavarian Castle
Direct bromide print from the negative



A Bavarian Castle: By F. C. Tilney
Bromoil print, showing particularly the accents of light put in on the tower

good brand of one or other of them will serve the oil worker as what is known among oil-printers as a "soft" ink. The "hard" ink, of equal service in pigmenting the print, is represented by a litho' ink, some varieties of which are too stiff for oil work and require reducing down with a little pure medium such as painters in oils mix with their colors. A third class of ink, also to be had from the printers' supply houses, is that used by copperplate printers. Lastly come the artists' tube oil colors, which as a rule are too soft for "oil" printing, and (even the "stiff") are of service only, as we shall see directly, in saving a print which is much under-exposed. The best advice to be given to the beginner is to get a supply of two inks only, a hard and a soft, and stick to those alone.

Color of the Ink

Although ink of any color can be made up for the oil process, there is very little to encourage one to depart from a good black, or, at any rate, to stray further than a sepia or a blue- or brown-black. The warmer colors go best with a paper of cream or ivory tint, whether by the oil or Bromoil process. The necessary touch of warmth or blueness may be given to a cold black by working up with *very little* of a brown or blue ink, but a very homogeneous mixture must be made; otherwise it is annoying to find after pigmenting that the color is not uniform throughout the picture. On the whole, it is best to stick to the ready-prepared inks rather than obtain variations of color by admixture. M. Demachy, if we are not mistaken, has done all his fine oil work in a black ink, and the results certainly leave nothing to be desired in respect of luster and richness.

Brushes

We owe the brush technique of oil printing to MM. Puyo and Demachy, who took up oil with great eagerness and speedily developed the pigmenting part of it into an art craft. The best brush, it was shown by these workers, is the so-called "stag's foot" shape (French "pied de biche") of fitch hair (Fig. 2). The shape of the brush allows of quite a large brush being used for somewhat small areas in the print, as only the curved tip of the brush need be applied. A flattened brush is useless in this respect. These brushes are doubtless obtainable from artists' supply dealers, though they are essentially French manufactures. In England, the "pied de biche" (French make) are sold by all the firms who have taken up "oil" requisites. M. Puyo has stated that those used by him are purchased from M. Bullier, 5 Rue Charlot, Paris. They are somewhat expensive, but fortunately only one or two are really necessary, one well-known English worker, H. W. Rennie, using the No. 14 for all purposes. Still, if a worker is buying a full set of brushes, suitable for continuous work, he may be advised to follow Mr. S. L. Coulthurst's selection, and obtain of the stag-foot fitches, two of No. 14, two of No. 10, two of No. 7, and one of No. 5. In addition to these, one or two of the flat-ended pattern for use in larger or broader work. One or two small hard hog's hair brushes are also useful for taking off pigment, and so giving small light accents to the print. Brushes must be handled carefully, so as not to distort them, or they lose their natural dome shape. To clean them, they are dipped in benzoline or automobile petrol, or the noninflammable "Carbona."

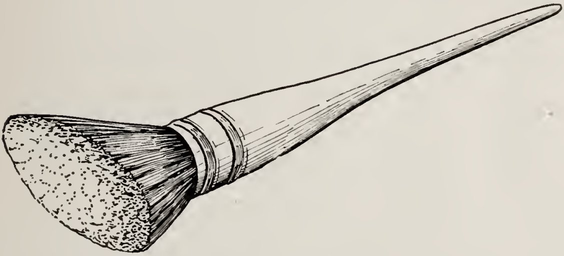
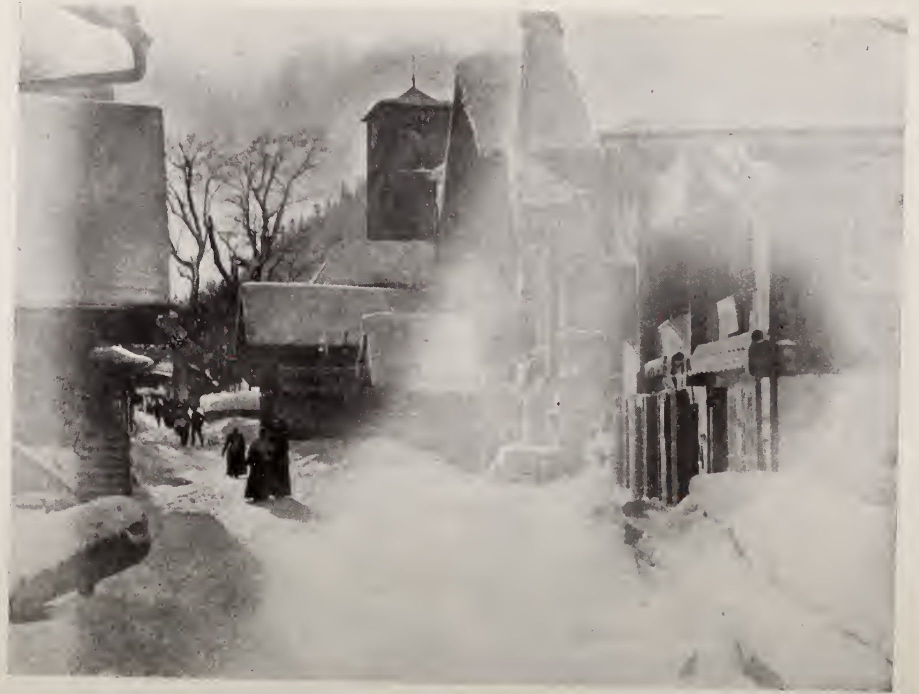


FIG. 2. The French "pied de biche" brush. The domed end allows of a large brush being used on quite small areas

Pigmenting the Print

The thoroughly soaked print, bearing its scarcely visible image, must be kept very moist throughout applying the ink. If it is not, the ink will take all over equally well. While the surface must be free from adhering water, the state of moisture of the print should be such that



An Oil Print, Partly Pigmented
By S. L. Coulthurst, F.R.P.S.

the back is quite wet. To secure this over the considerable time, say, a couple of hours, which many workers will spend on a print, several thicknesses of stout blotting paper are thoroughly wetted, laid on a board and covered with one (or two) thicknesses of clean thin muslin. On this wet support the print is laid. If it tends to dry, it should be lifted off the pad, some water poured on the latter, and the print replaced.

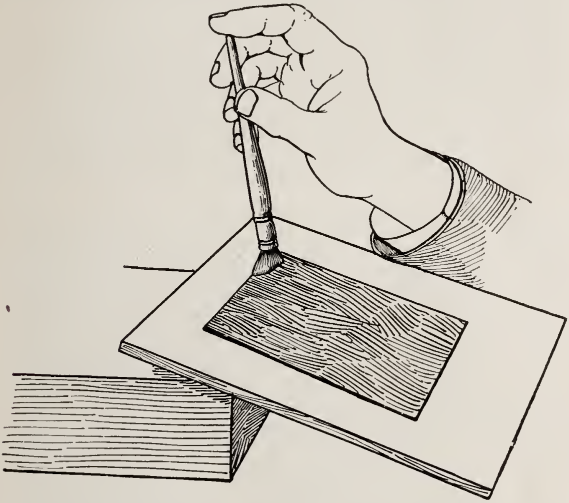


FIG. 3. Inking the print by dabbing. The print is laid on several thicknesses of wet blotting paper, on which is a cover of thin muslin.

The Technique of Pigmenting

The most difficult part of the process to communicate in words is the use of the inked brush in pigmenting the image. First of all, let the beginner learn to use the brush *lightly*. In M. Demachy's phrase, "oil printing is distinctly not an athletic pastime." It involves a delicate touch, but the precise description of "touch" is what must be learnt in practice. M. Demachy has put the principle of the touch into a few sentences: "Bear in mind that every application of the ink-charged brush is composed of two actions, each of which produces an opposite result—the downward and the upward action—separated by a period of contact which we must admit is part of the first and downward movement. The first movement brings the ink into contact with the film. The second movement removes it wholly or partly. These two actions may be so balanced that no result will be perceptible, the ink applied by the downward action having been removed by the upward one. It follows that, according to the delicate pressure of the hand in applying the ink, and according to the varying elasticity of the wrist in removing the brush from its close contact with the film, varying quantities of ink may be applied or brought away."

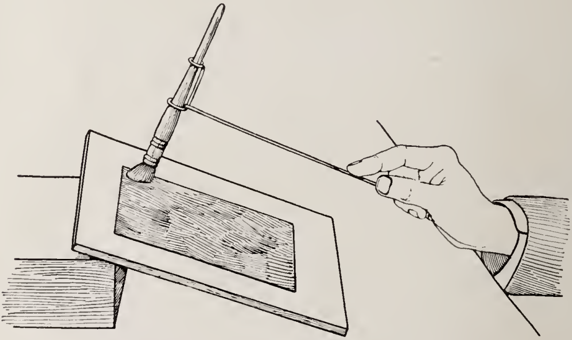
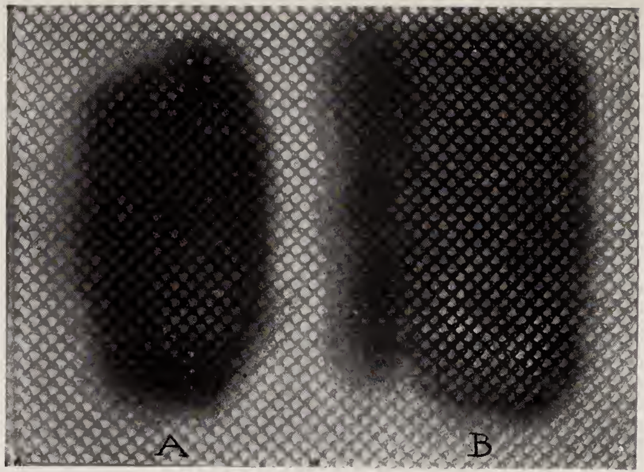


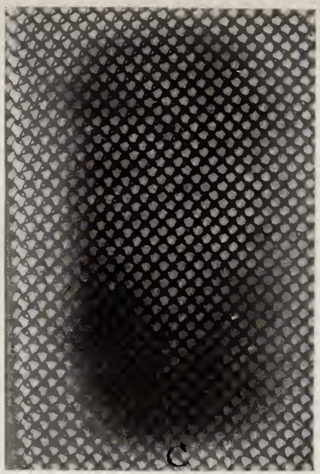
FIG. 4.—"Hopping" with the aid of a wire holder for the brush. "Hopping" can be done also whilst holding the brush in the fingers.

That describes the principle on which the print is pigmented. In applying it, individual workers will develop a " touch " which becomes second nature. In starting to work, we place before us a rough print of the subject as a guide to what we are doing, and apply a little of both the hard and the soft ink to different parts of a piece of Bristol board (the best palette)—a very small piece, which should be spread out flat on the palette, so that the ink will be taken up evenly by the brush. If the print has any drops of water on it, mop these off with a soft ball of muslin or a sheet of blotting paper.



Medium ink; effect of first application by dabbing.

Medium ink; effect of further dabbing with same brush—ink removed from high lights to left, reversal produced at first inking.



Medium ink applied as in B. Upper part "hopped," clearing off ink and giving contrast. Lower part left "unhopped."

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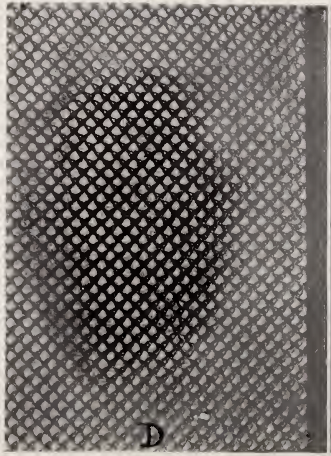
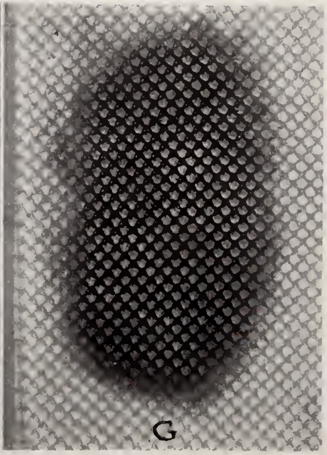


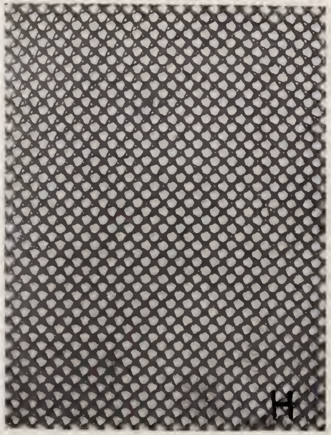
D

Medium ink applied first as in B, then ''brushed'' or ''swept'' removing ink from high lights.



G

Soft ink, applied first as in B. Then ''swept,'' clearing from lights and depositing more in shadows compared with D.



H

From bromide print of original subject. Different portions of the same print (treated by the Bromoil process) were used for examples A, B, C, etc.

The print is first brought up light in all parts. We then see, from the guide print, which are the parts where most and least pigment is to go. The brush is held at the top, flexibly between the two first fingers and thumb (Fig. 3). It should not be grasped firmly, nor held down near the mounting of the hairs. Holding it thus lightly, almost loosely, the print is gone over with a small tapping movement, which deposits pigment in proportion as it is done leisurely, and removes pigment as it is quickened or made more "staccato." For enhancing contrast, this tapping movement will be combined with something of a dragging or sweeping motion, which helps to clear pigment from the high-lights and to increase it on the shadows. Such "sweep" or "swish," to use shop terms of the oil-printer, is of very small range, but is repeated over the area of the print which is under treatment. "Hopping" is another "touch" which removes pigment. It is simply very quick tapping, literally dropping the brush from an inch or so above the print and taking it up again quickly. A semi-mechanical method of producing the movement is to mount the brush on a piece of stiff wire about eight inches in length; the hand alone will then give this quick up and down movement of the brush by virtue of the spring in the wire. (Fig. 4.) But the "hopping" is, or should be, used chiefly for removing ink which has been too freely applied.

Illustrations of Touches

The best means of getting an idea of the effect of these different methods of applying or removing the ink is to take for our subject a photograph of a pattern in which we can get both light and shade repeated uniformly over the whole area. For this purpose a wire door mat was photographed, and the negative purposely kept fairly soft so as not to give a print in black and white only. H is a direct bromide print from this negative. The other prints, A to G, for the pigmenting of which we are indebted to Mr. F. C. Tilney, show the various effects which can be produced by varying the method of using the brush.

A shows the result of first application of a medium ink to the attractive surface, in this case that of a Bromoil. B shows the effect of further dabbing—the light spots are somewhat cleared. To the left may be seen the reversal, which appears when first inking a print, but afterward disappears.

C shows the effect of "hopping" very lightly—clearing of the ink off the high-lights. The lower portion has been left "unhopped." D, prepared first of all as in B, has been subjected to the "brushing" or "sweeping" action. "Sweeping" cleans off the ink, which, according to its hardness or softness, may either leave the darks as well as the lights, or may accumulate upon the darks as the brush passes over them. The method gives a maximum of brilliancy.

G shows the effect of "sweeping" under conditions similar to those of D, except that a softer ink was used. Note the heavier deposition of ink on the shadows.

Using Hard and Soft Ink

In general we bring out the print with a hard ink, changing the brush as the portions of the subject require a fine application of ink or can do with a broader area of inked-hairs. Parts which fail to come up to the depth required may then be taken in hand with the soft ink; for what is under-exposure to the hard ink will be correct or over-exposure to the soft. The soft ink must follow the hard; it is impracticable to attempt adding hard ink to parts which have been inked in soft. The result is to remove the soft ink.

The richness which is characteristic of a good oil print will come with practice, if these general principles of inking be kept in mind. As regards advice as to where the shadows are to be increased and where the light-accents should be placed, neither practice nor teaching will tell the worker this, unless he has it in him to appreciate the value of these tones himself. But for his encouragement let it be said that, if his photographic print possesses some claims to pictorial qualities, a *little* use of the power allowed by the oil process will most certainly improve the result more than a good deal of "control." Some have written as though the impression from the photographic negative was necessarily altogether bad. Though the esthetics of the process are beyond the scope of this monograph, we must find space for one more quotation from M. Demachy: "The purely photographic values of most straight prints are not all wrong; it is their relation to each other which is generally faulty. In many instances, only one or two portions of the picture will need darkening or lightening to a certain extent, which must be the proper extent."

Over- and Under-Exposure

One of the questions which the oil worker soonest comes to ask himself is as to the correctness or otherwise of the exposure. The best test to bear in mind is that over-exposure means more active retention of the ink, hard or soft. An under-exposed print with a soft ink will give a result which, as regards contrast alone, is not very different from an over-exposed print with a hard ink. But the retention of the ink, say, in the half-tones, will be much more vigorous in the latter case, and that, as M. Demachy has pointed out, should be the final test of exposure. In the case of an under-exposed print, one stroke of a wet brush or wet muslin pad will remove the hard ink; but, with over-exposure, the soft ink under similar treatment will come away only with considerable rubbing, and leave the surface spotty. In general, however, the mark of over-exposure is flatness; a hard ink is the means of avoiding it. The mark of under-exposure is reluctance of the image to appear, with often a granular deposit where the ink can be got to "take;" the remedy in this case is a softer ink, or one softened by very minute addition of medium or linseed oil.

Hairs on Prints

One nuisance of the pigmenting process is the persistence with which even the best brushes deposit tiny hairs on the print. On occasion, the labor of removing them when the print is done will be greater than that of applying the ink. One worker has advocated thinning the ink with petrol and filtering it through muslin, but the more practical way of getting over the trouble is that suggested by Mr. Harold Baker. Keep the supply of ink in a metal box with a tight-fitting lid, such as the tins in which shoe or metal polish is supplied, and for each print to be pigmented, take out a little of the ink for use and throw away any left over. If this be done, and if the brushes be well cleaned with petrol before starting on a fresh print, there will be much less cause to complain of hairs on the finished prints.

Final Stage: Oil Printing

When the fully pigmented print has been judged satisfactory, it remains to pin it down on a board in a place as free from dust as possible until the ink is dry. That may require hours or days, according to the nature of the ink and the paper. When dry, some further light accents can be put in on the print by means of a piece of sharply pointed india-rubber eraser. To strengthen shadows, on the other hand, it is necessary to soak the print afresh in water until the relief is obtained, and then to do what is necessary with a soft ink. If it is thought that the general effect can be improved upon by beginning anew, the whole ink impression can be cleaned off with petrol, the print gone over with clean water and a sponge, and then re-soaked before commencing to pigment the print again.

Mounting Oil Prints

There is a temptation for the oil worker to hasten to mount his print before the ink deposit is fully hard. Depending on the ink and the paper, a print may not become so quickly fixed that it will withstand rubbing within a week. For framing immediately, the best plan is to attach to the mount by a touch of strong adhesive at the two top corners. Even greater precaution is necessary if the print is to be dry-mounted, for the heat of the press will fetch off large patches of the ink unless the latter has fully hardened; at least twenty-four hours should be allowed to elapse before mounting prints by this method. The Bromoil print is even slower than those by the "oil" process in reaching the hardened condition, owing to the less porous nature of the support. The factors most favorable to rapid drying in either case are moderate warmth and plenty of air. Some workers, on this account, use a drying cupboard of the kind commonly employed by carbon printers for drying tissue after sensitizing.

The Bromoil Process

In Bromoil we have a more rapid and convenient method of producing the oil print. The starting point of the process is a good bromide print, by contact or enlargement from the negative. This print is bleached in a solution the basis of which is potass bichromate, is passed through an acid bath and is finally fixed and washed, after which it is ready for pigmenting. This is the procedure worked out by Mr. Welborne Piper, the inventor of the process, as first published in the "Photographic News" for September 6, 1907. It still remains as satisfactory and reliable a method of working as any, though several variations, further shortening the process or avoiding the use of the acid bath, have been introduced.

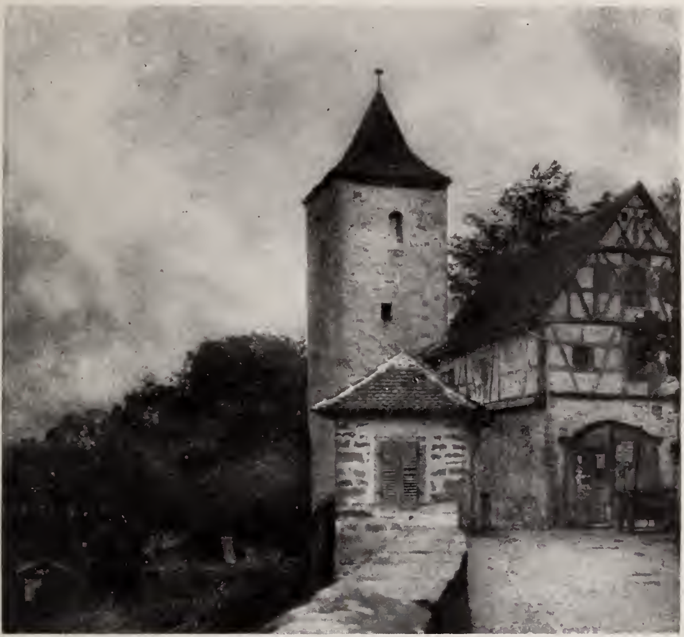
The Bromide Print

Most bromide papers of fine matt or semi-matt surface are suitable for Bromoil. Glossy papers are less favorable to pigmenting, and, in any case, the glossy surface is not one to be desired. Gaslight or slow development papers have not, so far, been found suitable for the process, apparently because of the presence of chloride in the emulsion. Among bromide papers, hardness of surface is an important consideration, as both the use of the acid bath and the pigmenting process call for considerable resistance on the part of the gelatine surface. Most leading brands of matt and semi-matt bromide paper have been found suitable. In the case of those of softer film, the avoidance of warm solutions, coupled with shorter time in the acid, will suffice to adjust matters, but it is dangerous to generalize in this respect. A bromide paper is specially made for the process by Griffins, London, under the name of "Bromoil." It is supplied in both smooth and rough varieties, and has a hardened surface which allows of vigorous pigmenting. An alum or formalin bath, in toughening the surface of the bromide print, has not been found of much use unless applied to the sensitive unexposed paper. Mr. Greenall uses a solution of formalin 1 part; methylated spirits (or Columbian spirit) 48 parts; immersing the bromide paper for half a minute and pinning up to dry. This preliminary treatment (which of course must be done in deep orange light) will enable the surface to withstand vigorous inking and may be adopted by those who experience trouble from the delicacy of the gelatine.

The most suitable developer for the bromide is amidol; metol-hydroquinone suits many papers, but for

An Ancient Town Wall
From a straight bromide print

some obscure reason the result of amidol development seems to pigment better. The best print is one with full detail everywhere, and without excessive vigor in the shadows. The pigmenting allows of extra depth of shadow being easily piled on with a soft ink, whereas, if detail in the bromide is faint or has been got out only by forcing development, it will be found that the most patient pigmenting will fail to bring it up. As in the "oil" process, results with richness and beauty demand a really good print, produced without tinkering, from a good negative. The print is fixed and washed in the ordinary way, and may be put through the Bromoil process forthwith, or dried and kept for a reasonable time before doing so. In fact, the hardening of the gelatine surface which then takes place is an advantage.



An Ancient Town Wall: By F. C. Tilney

Bromoil print, showing the massing of the composition and the balance given by the cloud worked in on the gelatine surface with the brush.

Treating Bromides for Bromoil

The bleaching solution worked out by Mr. Piper, and hitherto most commonly adopted by workers of the process, is as follows: Ozobrome stock solution,* 4 parts; Potash alum, 10 per cent solution, 4 parts; Citric acid, 10 per cent solution, 1 part; Water to make in all, 20 parts.

This is made up when required and thrown away after use, as it will not keep. Its bleaching action is rapid; in less than two minutes the black bromide image is converted into one of pale brown, and no good is gained by continuing the action of the bleacher after it is seen that all black has been thus converted. The bath can be used for several prints in succession, a useful rule being that the quantity of bath sufficing to cover a print may be used to bleach not more than six prints of the same size. The bleached print is now given a momentary rinse by lowering it into a dish of water and then transferred to an acid bath composed of: Water, 20 ounces; sulphuric acid (concentrated), 1 ounce. This bath should be made up in fair quantity beforehand and time left for it to cool, as the addition of the acid to the water develops considerable heat. And note particularly that the acid (measured in a graduate) must be poured *into the water;* if water be added to the acid, the action may be violent enough to splash the acid mixture about, and generate heat which will crack the bottle.

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*As sold in U. S. by the Eastman Kodak Co.; in Britain, by Ozobrome Ltd.

In the acid bath, the pale brown image almost completely disappears; a greenish image remains, but so faint that it is difficult to identify subjects from it. The acid should bring the image into slight relief, as may be seen by blowing a patch of the print surface-dry where a high-light comes against a shadow, which latter should show as sunk compared with the high-light. From two to five minutes is ample for the action of the acid, and the print is then given a few minutes' wash in water, and fixed for about two minutes (ample) in: Hypo, 2 ounces; soda sulphite, ½ ounce; water, 20 ounces; after which it is washed for a few minutes and is ready for pigmenting. This, as indicated on page 466, may be done at any convenient time.

A very essential point in the Bromoil process is to pass prints quickly through the operations according to a scheduled time, which should be approximately as follows:

Bleaching	2 minutes
Rinse	½ minute
Acid	5 minutes
Wash	5 minutes
Fixing	2 minutes
Wash	5 minutes

the whole process should not take longer than twenty minutes, and of course is done throughout in full light.

Some Precautions

The acid bath renders the paper very tender, and care should be taken in handling prints not to drag them with a jerk, causing creasing or stretching.

The solutions should be used at near about 65° Fahr., not colder than 60° or warmer than 70°. This applies particularly to the fixer and final wash with water, chilling of which is apt to create difficulty afterward in getting the print to pigment. In this respect Bromoil is quite on a par with "oil," except that the lengthy soaking which is necessary in the case of "oil" is not required with Bromoil. But the effect of a chilled wash-water is equally apparent in both instances.

The other source of trouble is one which it is almost impossible to remove, since it is the different, and sometimes differing, character of the bromide paper. Some papers will work best in cold weather, but give flat results in summer; whilst with others precisely the reverse is the case. And occasionally one hears of a paper which in winter requires solutions to be well over 70° Fahr., and yet in summer will not respond to the process if the baths exceed 60°, apparently the result of a change in the emulsion by the maker with the season. The moral for the beginner in the process is to confine his work at the start to a few papers, and select one of these which secures him good contrast in the Bromoil.

Pigmenting

The principles of applying ink to the Bromoil are not different from those which govern the "oil" process, except in so far that the Bromoil surface retains pigment more tenaciously than does "oil" and, therefore, the procedure requires it to be more tentative. A softer ink may be used in Bromoil than in "oil" as a general standard. Otherwise, everything already said of this part of the process applies equally to Bromoil. Brushes and inks are the same for both, and can be used intermittently for both without detriment. In both cases, too, the underside of the print must be kept wet during inking. And, lastly, the possibilities of going too far from the photographic base assail the Bromoil worker no less than him of "oil." From the examples which are reproduced on other pages, the reader can judge for himself of the extent to which variations in tone, and even in drawing, may be introduced into the photograph.

Other Formulæ

So far the formulæ given for Bromoil have been those laid down by Mr. Welborne Piper at the time of his origination of the process. Since then, a number of workers have introduced modifications, several of which deserve to be mentioned, since in some cases they simplify the process and in others render it more generally available.

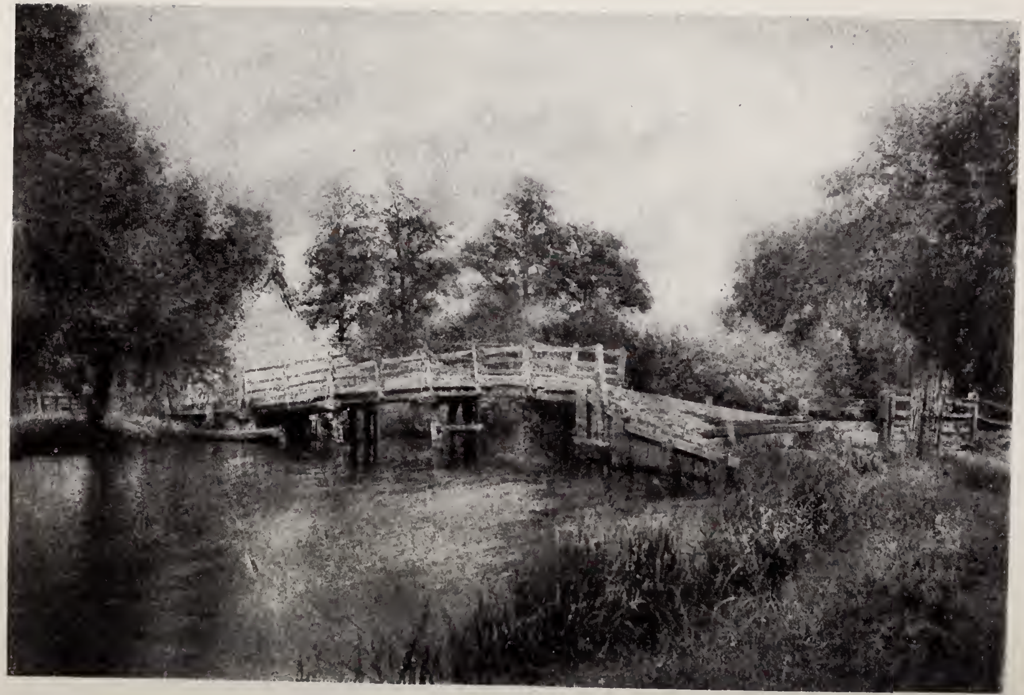
A Bromoil "Bleach" Formula

A very useful formula from which the bleaching solution for the process can be made up with chemicals to be bought at any drug store is the following, due to Mr. H. W. Rennie: 10 per cent solution potass bromide, 3 parts; 10 per cent solution potass ferricyanide, 2 parts; 10 per cent solution potass bichromate, 4 parts; hydrochloric acid (10 per cent solution), 3 parts; 10 per cent solution alum, 8 parts. The solutions are kept separately and mixed at the time of use. This bleacher is best used at a temperature of 75° Fahr., the print being then rinsed and passed through the acid and fixing bath exactly as already described.

Ozobrome Acid Formulæ

A bleacher which apparently amounts to very much the same thing as that just mentioned is made up as follows: Ozobrome solution as sold, 1 part; 1 per cent solution hydrochloric acid, 5 parts; water, 4 parts. The 1 per cent acid is made by adding 2 drachms (fluid) of pure hydrochloric acid (sp. gr. 1.16) to 25 ounces of water. In this bleach the bromide print becomes pale brown in from 1 to 3 minutes, and is then placed direct in a fixing bath of: Hypo, 2 ounces; ammonia, .880; 1 drachm (fluid); water, 20 ounces; where it is allowed to remain for from two to six minutes,—for the shorter time if it has bleached quickly (in about one minute), or for longer if bleaching has been complete in two to three minutes. It is then washed for a minute or two, and is then best dried and re-soaked for about twenty minutes, to prepare it for pigmenting. This process dispenses with the use of a separate bath, but if prints

From an Oil Print by S. L. Coulthurst, F.R.P.S.



The Old Bridge: By S. L. Coulthurst, F.R.P.S.
From an oil print on rough-surface paper to show sketch effect

are pigmented straight from the wash water there is a difficulty in getting contrast. After being made bone-dry, the print gives contrast much better.

A further formula for use with the Ozobrome solution is one consisting of equal parts of the solution as sold and the following stock acid bath: Chrome alum, 180 grains; potass bisulphate (acid sulphate of potass, cryst), 60 grains; citric acid, 25 grains; water, 25 ounces. The chemicals are dissolved in 10 ounces of hot water and the rest of the water added cold.

Another Non-Acid Method

Quite a distinct method of dispensing with the acid bath has been worked out by C. H. Hewitt. The print, bleached in the standard ozobrome mixture (Piper's formula), is rinsed in several changes of water and placed in a solution of ammonium sulphocyanide (1 ounce), in water (20 ounces), which not only produces the relief but fixes the print. A brief final wash brings the print into a state of readiness for pigmenting.

A Rapid Method

Another departure from standard practice is chiefly of value when one is preparing a single print for pigmenting in the least possible time. The process, which is due to J. M. Sellors, consists in developing the print in amidol in the usual way, rinsing for a minute under a spray, and then (instead of fixing) placing the print, in its unfixed state, into the bleacher (Piper formula) warmed to 80° Fahr. to 90° Fahr. Bleaching is complete in from two to three minutes, the print is given another rinse for a minute under a spray and is then put in the acid bath. Once it is in the acid, white light can be used for the rest of the process, which consists only in a further one-minute rinse, fixing in the hypo and sulphite bath for five minutes, and a final wash for ten minutes, preparatory to pigmenting. In this way a Bromoil ready for pigmenting can be got ready within half an hour of exposing the bromide paper in the printing frame or enlarging lantern. And the process can be still further shortened by using the Hewitt sulphocyanide as a substitute for acid and fixer; but when this is done a larger proportion of citric acid, one and one-half to twice the quantity, should be used, otherwise the results are lacking in contrast.

Pigmenting Toned or Re-developed Prints

It will readily occur to those familiar with the toning processes employed with bromide paper (See THE PHOTO-MINIATURE, No. 103, Toning Bromide and Gaslight Papers) that the bleaching solution of the Bromoil process is one which may be used quite well in the so-called "sulphide" method of toning, and that the bleached image may likewise be re-developed in any strong and clean-working solution. Either of these processes can be applied to the print bleached in the Piper standard formula without affecting the powers of the image to attract greasy ink, and therefore we can, if we wish, apply the ink not to form the image but to supplement an image prepared in black or brown according to the darkening re-agent applied to it. A strong amidol developer is about the best formula with which to bring back the bleached image to full vigor. The only drawback to this method is getting an ink which is a perfect match with the image of silver (re-development) or sulphide (toning). Nevertheless, the method is a very useful means of introducing darker accents into the print, and a slight difference in color will be of no consequence when the purpose of the print is reproduction in the press; which is a reminder that at least one publisher of illustrated books in America is using oil prints, prepared for the purpose by a leading French worker, in the process.

Photogravure Effects with Bromoil

The ink image in a Bromoil print lies in intaglio—that is, is sunken below the level which marks the high-lights of the subject. The conditions of things is analogous to that in a photogravure plate, and in the case of the Bromoil, just as in that of the photogravure plate, we can apply a piece of plain absorbent paper and soak up the ink from the depressions in which it lies. Mr. C. H. Hewitt, who was the first to point out this fact, takes advantage of it to produce an impression resembling a photogravure. The freshly made Bromoil is placed whilst still damp on the bed of a copperplate press, placing under it a piece of card of the exact size of the plate-mark desired in the impression. Over the print a thin mask of paper is placed,—symmetrically, of course, with the card below and showing the exact amount of the subject to be obtained. A piece of plate paper is now laid over all, and an impression pulled as in ordinary copperplate printing. The plate paper withdraws the ink from the Bromoil, giving a purely mechanical duplicate, reversed as regards right and left, but reproducing the tenal values of the Bromoil. There is no doubt that further use will be made of the inked intaglio image of the Bromoil print in photo-mechanical work, but meanwhile the above process supplies the means of preparing an ink impression on pure paper.

Acknowledgment

Cordial acknowledgment is here made of the help given by Mr. S. L. Coulthurst, of Manchester, of whose experience in oil and bromoil liberal advantage has been taken in preparing this monograph, and of whose mastery of the technique of the process we are glad to reproduce one or two examples.

To Mr. F. C. Tilney thanks are also due for the opportunity granted of showing the use which can be made of the latitude of Bromoil in the hands of a trained artist.

BOOKS

The Oil and Bromoil Processes. By F. J. Mortimer and S. L. Coulthurst. 1909. 50 cents.

The Sinclair Handbook of Photography, containing a chapter on oil, by M. Demachy, and on Bromoil by C. H. Hewitt. 1908. 50 cents.

Le Procédé Rawlins à l'Huile. By C. Puyo. Paris, the Photo-Club, 44 Rue de Mathurins. 1 fr. 50 cents. (On the oil process only, and a very comprehensive manual, in French, on the technique of pigmenting. A fair proportion of the text is translated in the "British Journal of Photography" for Aug. 30, 1907.)

The Bromoil Process is the subject of a lengthy paper by C. Welborne Piper in "*Photographic Journal*" for February, 1909.

The Oil Process is treated also very fully by John H. Gear in the same journal for March, 1909. (Copies obtainable at 35 cents each from the Royal Photographic Society, 35 Russell Square, London, England.)

Notes and Comment

With a keen sense of personal loss, we record the death of our old friend and co-worker, Dr. John Nicol, which took place March 13, at Clifton Springs, N. Y.

Born in Scotland in 1828, and taking up photography as an amateur in the early forties, Dr. Nicol was one of the few men of our day who possessed a personal knowledge of the development of photography from its earliest beginnings to its present perfection. In his boyhood he was apprenticed to the drug business, and it was doubtless his study of chemistry which turned his attention to photography. Be this as it may, we find him contributing technical papers to the "Photographic News" and other journals as far back as 1856, since which time his connection with the photographic press ceased only with his death—passing half a century of service. During his long and active life, he met and corresponded with many of the "grand old men" of photography, among them Sir David Brewster, Rejlander, Sayce, Russell, Hardwich, Woodbury, Warneuke, Dr. Vogel, Wilson, M. Carey Lea and others of equal note, of whom he would talk with lively interest when in the mood. Coming to America in the eighties, Dr. Nicol edited successively "The Photo Beacon" and "The American Amateur Photographer," both since merged in "American Photography," of which journal he was one of the editors at the time of his death. He was a born teacher, fluent, widely informed, and always interesting as a writer, frank in his criticisms, but sincere and kindly, and gathered about him a considerable following of enthusiastic workers to whom his word was gospel.

Dear Nicol, genial, virile, warm-hearted, full of fight and fun, abounding in good humor and brave spirits, and quite unspoiled by the generous affection of his innumerable friends: *requiescat in pace.*

Camera Adventures in the African Wilds: Being an Account of a Four Months' Expedition in British East Africa, for the Purpose of Securing Photographs of the Game from Life. By A. Radclyffe Dugmore, F. R. G. S. Pp. 233; 140 illust., 4to, $6. New York: Doubleday, Page & Co. London: W. Heinemann.

Quite apart from its interest to travelers and sportsmen, this splendid volume appeals peculiarly to amateur photographers, since it is primarily the record of a photographic expedition and abounds in information bearing upon the use of the camera in photographing wild game under difficult and often perilous conditions. Mr. Dugmore tells his story with all the enthusiasm of a sportsman who has learned that it is more exciting and much more satisfactory to stalk rhinoceri, lions and the like with a camera instead of a gun. Especially thrilling are the chapters which describe the photographing, at fifteen yards distance, of a charging rhinoceros, and the making of flashlight photographs of lions at less than twelve yards distance. A notable feature of the expedition was the use of the telephoto lens, and the examples of telephotography given throughout the book are among the most remarkable achievements thus far recorded in this field. Abundant details are given at every point concerning the photographic equipment and methods used, and the illustrations are notable for their technical quality.

❧

The Twenty-fifth Annual Convention of the Photographers of the United Kingdom will, this year, meet at Scarborough, a charming resort on the east coast of England. The dates are July 4 to 9, Mr. Godfrey Bingley being the president for 1910. American visitors will be cordially welcomed.

❧

Those who have known the uncertainties and failures of all ordinary devices for the igniting of flash powder in open or magazine lamps will appreciate the simplicity, certainty and unfailing efficiency of the A. G. F. A. Flashlamp (improved model) just introduced by the Berlin

Aniline Works, New York. The A. G. F. A. Lamp, which retails at the very moderate price of $1.75, has for its special feature a toothed wheel which revolves on touching a winding spring, thus igniting a metallic substance in the base of the flash-pan, and producing a stream of sparks at each revolution. The device is not affected by damp or climatic conditions, and is as simple in its operation as it is certain in results. The lamp can be operated in the hand or used as a stand lamp with a simple attachment. It is well constructed and has a neat nickel finish.

❧

Under the title "Kodak at the North Pole," the Eastman Kodak Co., Rochester, N. Y., has published an interesting album of Polar pictures make by Anthony Fiala, Harry Whitney, Robert E. Peary and other arctic explorers. The text accompanying the illustrations is contributed by Mr. Fiala. Copies can be obtained from most dealers, or on request from the Eastman Kodak Co.

❧

George Murphy, Inc., New York, advise us that they have taken over the American agency for the well-known Wynne Infallible Exposure Meters, and can supply these in any style promptly, with the necessary "refills" and accessories. We have also received from this firm a new, illustrated catalogue of Ross Lenses, which is especially interesting in that it gives an account of the origin and evolution of the Ross "Homocentric" Lens. This catalogue and booklets covering the many imported specialties for which this old established house acts as American agent can be had on request.

❧

We are asked by The Taylor-Hobson Company to announce that their series II Cooke anastigmats may now be obtained to order, with extension lenses somewhat like those furnished for the other series. By removing the front glass and substituting another, the entire focal length is increased. Thus, from the same point of view, the photographer obtains larger images of distant objects. These extension lenses increase the size of image about fifty per cent; for example: an object taken with the normal lens, and two inches long in the photograph, is, from the same position, made three inches long with the extension lens. Better results are obtained than with the separate portions of other makes, practically two complete anastigmats being available. Present users should note that their series II lenses may be fitted with these new extensions, but the register number of the lens should be given with the order. Extension lenses for Cooke anastigmats other than the series II, have long been used, the back glass having hitherto been the one replaced. The series II are the only lenses which permit the change at the front.

❧

Compact, well arranged, carefully illustrated, and covering all the needs of amateur and professional photographers, briefly describes the new catalogue just received from the Obrig Camera Company, 147 Fulton street, New York. The catalogue can be had free on application, and is well worth the postal card required to bring it.

❧

The Photographers' Association of America held its executive session in Milwaukee during January to make the preliminary arrangements for the forthcoming Thirtieth Annual Convention of the Association. All the officers were present. The financial statement showed a cash balance on hand, January 1, 1910, of $6,483.22. It was decided to hold the convention at the auditorium in Milwaukee during the week of July 11. The school of photography, the non-competitive picture exhibit, the prize of $100 for the best invention, the congress of photography, and other special features, which were so warmly appreciated last year, are to be repeated at the next convention. It was decided to cöoperate in every way with the plans submitted by the Federation of Women Photographers, a branch of the Photographers' Association of America inaugurated at Rochester, 1909. It was decided to create a commercial photography section, with a display of other features, which should bring new interest into the forthcoming convention Special stress was laid upon the fact that the 1910 convention will be conducted under the revised constitution and bylaws, which were adopted at Rochester, 1909.

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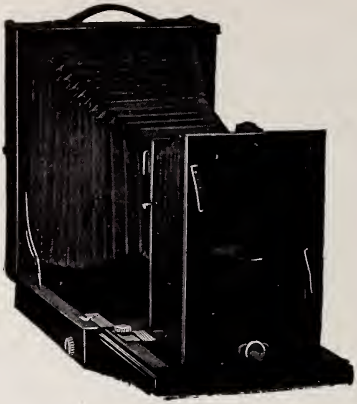

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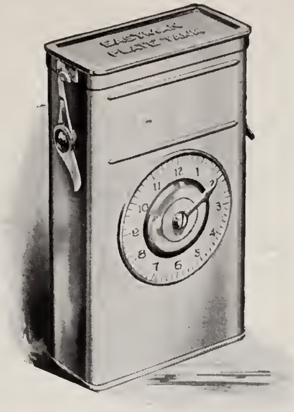

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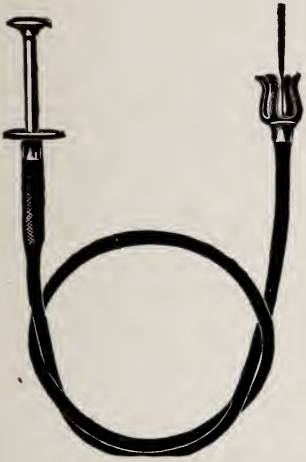

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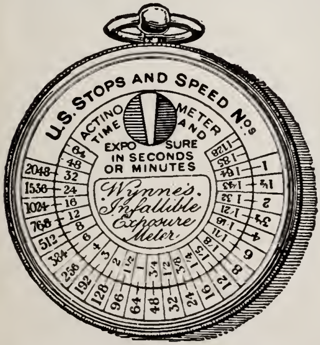

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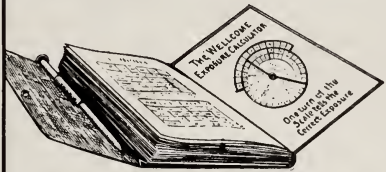
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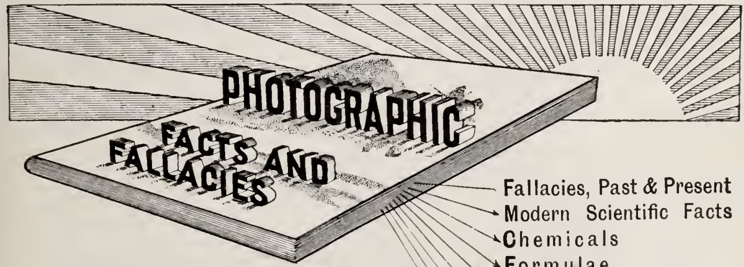

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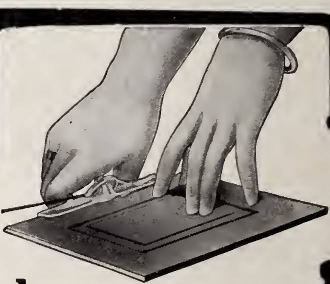

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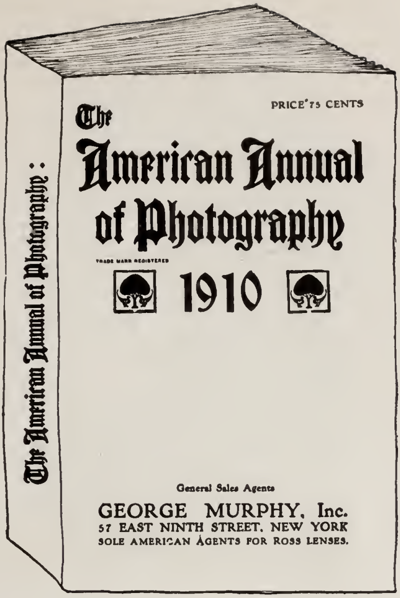
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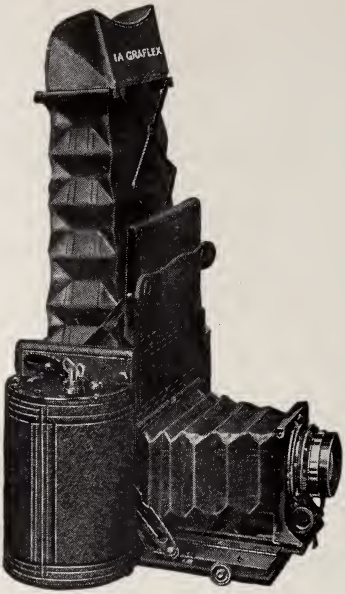

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SPECIFICATIONS

Outside dimensions, closed, 5½ x 9½ x 3 inches. Weight, 59 ounces

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1-A Graflex, without lens	**$60 00**
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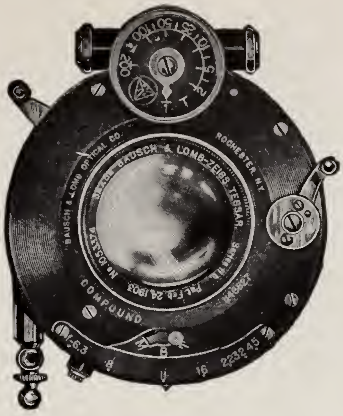

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Lens and New Compound Shutter

LIFE is made up of results — especially the camerist's life. But sometimes, alas! it seems to be made up of a striking lack of results.

¶ The real test of a lens comes when you meet the unfavorable conditions of time and weather or the illusiveness of moving things.

¶ The one unanswerable argument in favor of a lens is the results it will produce under all conditions — that is the vital point about the TESSAR; it is not a fair-weather lens, but when the light is weak you will get brilliant negatives, or if you require greater than ordinary speed you have the reserve power there to use.

¶ Nothing gets away from the man with a TESSAR—except trouble.

¶ It is the most satisfactory lens on the market.

¶ Our Compound Shutter is exceedingly simple and compact and is mechanically constructed upon the correct principle to secure even and efficient illumination.

¶ Set of sample prints showing scope of the TESSAR LENS on receipt of ten cents. Descriptive literature at photo dealers or direct from us.

Our Name on a Photographic Lens, Microscope, Field Glass, Laboratory Apparatus, Engineering or any other Scientific Instrument is our Guarantee.

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From the cutting of the seal to the developing of the film, simplicity is the very keynote of the

Premo Film Pack

Loading

Cut or break seal, open back of camera, drop in pack and it's done in daylight.

Exposing

Change film for successive exposures by merely pulling out from the top successive paper tabs.

Developing

Films may be automatically developed in the simple, inexpensive Premo Film Pack Tank, assuring the beginner as good negatives from every pack as the most experienced photographer could secure. And one or more films can be removed for development at any time.

Our illustrated catalogue describes this remarkable orthochromatic film method, shows how it will easily convert any plate camera into a daylight-loading film camera, and describes over fifty different styles and sizes of Premo cameras. Free at the dealers, or write us.

Important.—In writing, please be sure to specify PREMO Catalogue.

ROCHESTER OPTICAL DIVISION

Eastman Kodak Co. Rochester, N. Y.

Eastman Kodak Company

ROCHESTER, N. Y., *The Kodak City*

NIGHT PICTURES

The Kodak will work while there is light. Not alone daylight and flashlight, but by night light in towns and cities illuminated by arc lamps.

At night, in the winter, when the snow reflects the light, or in milder weather after a rain when the light is reflected from the wet walks and pavements, good night pictures are easily made.

Take your Kodak some still night and try it. When we say still night, we mean not necessarily a night when there is no noise, but a night when the wind is not blowing. Noise will not be visible on the negative but movement will, and we therefore use the term "some still night" advisedly.

Walk along the street until you strike a well-illuminated spot that looks good, set up the Kodak, either on a tripod or on some solid object, open the shutter and give on the average an exposure of ten to fifteen minutes. The exposure required of course depends on the quality and quantity of light, but ten to fifteen minutes is a fair average.

Passing people, wagons, etc., will not show on the negative, but should they stop for any length of time, close the shutter and reopen it after they have passed on, being careful not to jar or move the Kodak.

Avoid car lines, as the lighted cars in passing will cause a blur of light. Also avoid pointing the lens at a nearby arc lamp for the same reason. Distant arc lamps may be included in the picture, as the non-halation properties of Eastman N. C. film make this possible.

In addition to the non-halation properties so necessary, Eastman N. C. film has speed, which is very desirable at all times and especially so when making pictures by weak light.

Many pretty night pictures have been produced, and on account of the unusual conditions under which they are made such pictures always prove attractive and interesting.

KODAK TRIMMING BOARD

The convenience of these trimming boards will appeal to those who have tried to trim a print square with a knife or pair of scissors.

The upper squaring edge is a rule marked in inches which enables you to trim a print just the desired size.

The cutting edge and blade are of fine quality steel blades.

Hard wood—natural finish.

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ROCHESTER, N. Y., *The Kodak City*

THE PRICE

No. 1, capacity 5 x 5 inches	$0 40
No. 2, capacity 7 x 7 inches	60
Transparent trimming gauge (extra)	20

THE TIME IS NOW

We will suppose that you are not as yet a Kodak user, but you intend to be. You have seen pictures your friend made of his last year's vacation trip and intend to do likewise this year. You are putting off getting an outfit till later. Granting all these things, permit us to say—*now* is the time.

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10 EXPOSURES EASTMAN KODAK CO., ROCHESTER, N.Y. 3¼ X 5½ INCHES
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C

When you start on that trip you want to be experienced, and while the novice can produce good pictures with a Kodak, the experienced can produce better ones and the best are what you want.

Get your Kodak today. You can learn to operate it in a few minutes, as Kodaks are marvels of mechanical simplicity, but you have some things to learn in regard to the value of light and shade.

There are many interesting things in and near the home worth photographing, and in photographing them you are gaining the experience you will want when you go into camp or to the seashore.

With the experience gained, you will be able to correctly picture the scenes of the trip, the camp life or the days at the shore.

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3½ x 11 inches. Fine for panorams.

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TESTED CHEMICALS

The Kodak way is simple all along the line because we have provided for your every need.

The Kodak, with N. C. film and the Kodak film tank for developing take care of negative-making, and all without a dark-room. The tank is automatic.

Velox and our other papers, all simple in manipulation, make printing as easy as the making of the negatives.

Last but not least is the convenient form in which we supply all the necessary chemicals used in the making of both negatives and prints.

Our prepared powders are tested and carefully compounded in proper proportion—ready for use when dissolved in water.

You can, if you prefer, mix your solutions following the formula carefully which is printed on the direction sheets.

Whether you use prepared chemicals or chemicals in bulk and mix your solutions be sure to get E-K tested chemicals.

The quality of the picture largely depends on the quality of the chemicals used in producing it. That is why we test chemicals.

You start with the only Kodak, make your exposures on the only Kodak Film (Eastman N. C.) and print them on any of the good Eastman papers.

You can readily understand why it is a mistake to use anything but the best tested chemicals. Chemicals prepared and tested by the people who make the materials upon which the chemicals are to be used. Chemicals that must pass the most rigid tests before they are passed as O. K.

Be a discriminating buyer, and look for this quality mark on the label.

TESTED EK CHEMICALS

For your Post Card Prints use the

VELOX POST CARD ALBUM

The loose-leaf, lace system is used in the construction of this album, to accommodate extra leaves when needed.

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THE SALON EXHIBITOR'S FAVORITE

There are negatives—you've made some—which are simple in composition. Negatives which do not depend on fine detail to hold the eye or interest. Negatives which might be termed broad or sketchy and which should be printed accordingly.

Then there are negatives which are full of fine detail but simple in composition which would—from an artistic standpoint—be greatly improved by a blending of that finer detail.

These negatives depend only on their simple beauty of line, and for such negatives there is a paper which will produce the required softness—the breadth needed to produce an artistic effect.

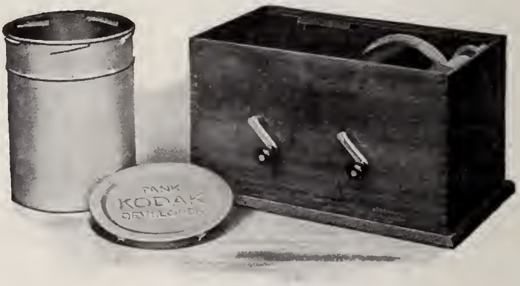
You have all seen gum prints—usually full of imperfections which detract from the general effect, but which have a breadth that is desirable.

There is a paper much used for salon pictures which is better. A paper that will give you the breadth of a gum print without its imperfections. A paper which will produce in warm glowing sepia a soft print, retaining all the beauty of line of the negative, but blending the finer detail in a truly artistic manner.

This paper is Eastman's Sepia Paper, and in addition to its artistic qualities it has another decided advantage—simplicity.

Just print, develop in clear water and fix. Nothing could be simpler.

Remember the name—Eastman's Sepia Paper.



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Metallic Substance
25 Cents

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Always Ready for Use
Handy Pocket Size

The special feature of this lamp is its use of a spark-giving metal in place of the uncertain striking safety match device. A winding spring revolves a toothed wheel against this metallic substance, giving an unfailing stream of sparks at each revolution.

Not affected by damp or climatic conditions. As simple in working as it is sure in results. Can be used as a stand lamp with a simple attachment, or operated by pneumatic release. Small in size, strongly built and elegantly finished in nickeled metal.

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